STATE APPROVED CPAP INSTRUCTION MATERIALS
Administration of Continuous Positive Airway Pressure (CPAP)

Bureau Local Health Support
and Emergency Medical Services
EMS Systems Section

INTRODUCTION

This is a minimum four (4) hour curriculum for use in preparing EMTs-Basic in the use of CPAP. Please note that if the student also needs instruction on pulse oximetry, there is an additional curriculum required.

Lead Instructor Qualifications:

A combination of instructors may be necessary to conduct this educational module. A Respiratory Therapist is an excellent choice for the technical instruction of CPAP, and if necessary, pulse oximetry. A qualified EMS Instructor/Coordinator who has been trained in the use of CPAP and approved to teach this module by the training center's medical director is also a good choice. In addition, the service medical director should provide education related to documentation and the completion of the data collection forms, and the use of the mandated protocol. The instructor for this educational module cannot be a sales representative although the sales representative can be present to demonstrate the actual device.

The service medical director and/or his/her designee must be present for the completion of the competency component of testing. The service medical director is the ONLY person who will have a copy of the CPAP exam and answer sheets and must maintain confidentiality of these materials.

The student must successfully complete both the written and practical components of the exam process. The service director must maintain all records and be ready to present at the time of a site visit by the State EMS Office.

WISCONSIN CPAP EDUCATION OUTLINE

This outline should be used in conjunction with the PowerPoint presentation which accompanies this material.

1. Introduction
    A. Course overview
    B. Learning objectives
    C. Introduction to CPAP
    D. CPAP vs. Bi-level Positive Airway Pressure (BiPAP)

2. Anatomy and physiology review
    A. Overview of pulmonary anatomy
    B. Overview of pulmonary physiology
    C. Outline of how CPAP affects the lungs during a respiratory emergency

3. Review of respiratory distress
    A. Pulmonary edema/Congestive heart failure (CHF)
        1) Signs and symptoms
        2) Assessment
        3) Treatment
    B. Chronic Obstructive Pulmonary Disease (COPD)
        1) Signs and symptoms
        2) Assessment
        3) Treatment
    C. Asthma
        1) Signs and symptoms
        2) Assessment
        3) Treatment
    D. Pneumonia
        1) Signs and symptoms
        2) Assessment
        3) Treatment

4. Respiratory Distress Protocol
    A. Deciding whether or not patient is candidate for CPAP
    B. What to do if they are not

5. CPAP Protocol
    A. Indications
    B. Contraindications
    C. Procedure
    D. Removal
    E. Special notes

6. CPAP procedure competency – skill check-off
    A. Patient assessment and treatment
    B. System setup
    C. Applying CPAP device to patient
    D. Monitoring patient
    E. Completing data sheet
    F. Medical Director sign-off

COMMONLY USED ACRONYMS

ALS	Advanced Life Support
BLHSEMS	Bureau of Local Health Support and Emergency Medical Services
BiPAP	Bi-level Positive Airway Pressure
BP	Blood Pressure
BVM	Bag Valve Mask
CHF	Congestive Heart Failure
COPD	Chronic Obstructive Pulmonary Disease
CPAP	Continuous Positive Airway Pressure
DNR	Do Not Resuscitate
DPH	Division of Public Health
ED	Emergency Department
FiO_2	Fractional Inspiratory Oxygen Concentration
HEENT	Head, Eyes, Ears, Nose, Throat
HPI	History Present Illness
HR	Heart Rate
JVD	Jugular Vein Distention
LOC	Level of Consciousness
PAC	Physician Advisory Committee
PEEP	Positive Expiratory End Pressure
PMH	Past Medical History
RDS	Respiratory Distress Score
RR	Respiratory Rate

CPAP COMPETENCY TEST SCENARIOS

Instructions: Each EMT is expected to make an accurate assessment of a patient in respiratory distress and determine whether or not they are a candidate for CPAP. They must then competently apply mask CPAP and monitor the patient appropriately. Finally, the EMT must accurately complete the CPAP Data Form. Read the following scenario and additional information as requested by the EMT. Have another individual act the role of the patient and simulate the physical findings.

Scenario One

Dispatch: You are called to a 70 y/o man c/o breathing problems
HPI: Increasing shortness of breath for 1 day despite the use of inhalers.
PmHx: COPD, Hypertension, and Diabetes
Medications: Albuterol Inhaler, Lasix, and Aspirin
Physical Exam: Thin white man on home oxygen breathing through pursed lips sitting in a tripod position.
Vital Signs: BP 180/90, HR 120 sinus tachycardia, RR 30, O2 sat 88%, LOC alert, airway patent.

HEENT: Perioral cyanosis, no JVD
Pulmonary: Lung auscultation reveals inspiratory and expiratory wheezes.
Extremities: Cyanotic, no pedal edema

After CPAP started:

- 5 min Vital Signs: HR 130, RR 24, BP 160/90, O2 sat 92%, LOC Alert
- 10 min Vital Signs: HR 120, RR, 24, BP 120/90, O2 sat 92%, LOC Alert

Scenario Two

Dispatch: 65 y/o woman c/o of shortness of breath
HPI: 1 week h/o progressive dyspnea with exertion. Unable to lay down flat without shortness of breath, no chest pain or cough.
PmHx: Hypertension, Diabetes
Medications: Lasix, Atenolol, and Glucaphage
Physical Exam: 260 lb woman sitting in recliner.
Vital Signs: BP 100/80, HR 140 sinus tachycardia, RR 30, O2 sat 78%, LOC follows commands, airway patent

HEENT: Cyanosis, JVD present
Pulmonary: Rales in all lung fields
Extremities: Cyanotic, 3+ pedal edema

After CPAP started:

- 5 min Vital Signs: HR 100, RR 24, BP 100/60, O2 sat 84%, LOC Verbal stimuli
- 10 min Vital Signs: HR 30, RR 6, BP 60/40, O2 sat 60%, LOC Unresponsive

EMT CPAP COMPETENCY

(This test is to be administered at the end of the CPAP training course for documentation of competency in recognition of respiratory emergencies and use of mask Continuous Positive Airway Pressure devices.

Service Name: _____

EMT Name: _____ EMT License #_____

Test Score: _____

Scenario One Score

Critical Steps:	**Yes**	**No**
1. Follows Respiratory Distress Algorithm?	___	___
2. Determines Patient is CPAP candidate?	___	___
3. Begins Albuterol administration?	___	___
4. Applies CPAP correctly?	___	___
5. Monitors patient?	___	___
6. Provides appropriate radio report?	___	___
7. Requests ALS Intercept	___	___
8. Accurately completes CPAP Data Form	___	___

Scenario Two Score

Critical Steps:	**Yes**	**No**
1. Follows Respiratory Distress Algorithm?	___	___
2. Determines Patient is CPAP candidate?	___	___
3. Begins Nitroglycerin administration?	___	___
4. Applies CPAP correctly?	___	___
5. Monitors patient?	___	___
6. **Removes CPAP and begins BVM?**	___	___
7. Provides appropriate radio report?	___	___
8. Requests ALS Intercept	___	___
9. Accurately completes CPAP Data Form	___	___

This individual has successfully completed the CPAP education and is authorized to provide CPAP administration to patients in respiratory distress.

_____
Medical Director Signature

_____
Date

WISCONSIN CPAP PROJECT COURSE WRITTEN TEST

(This test is to be administered at the end of the CPAP training course for documentation of knowledge in respiratory emergencies and Continuous Positive Airway Pressure devices. A passing score will include 80 points and above with each question worth 4 points.)

1. The primary pulmonary abnormality in patients with an asthma or COPD attack is;
    a. Poor oxygenation
    b. Poor ventilation
    c. Poor perfusion
    d. None of the above

2. Exchange of oxygen and carbon dioxide occurs in the;
    a. Alveoli
    b. Terminal Bronchioles
    c. Pulmonary vein
    d. Trachea

3. According to the protocol, all of the following are signs or symptoms of respiratory distress <u>except</u>;
    a. Tachypnea
    b. Pursed-lip breathing
    c. Wheezing
    d. Hypotension

4. According to the protocol, a potential CPAP candidate patient must have;
    a. Oxygen saturation less than 94%
    b. Respiratory rate greater than 25/minute
    c. Retractions or use of accessory muscles
    d. At least two of the above
    e. All three of the above

5. A patient who is suffering a severe asthma attack can have either CPAP applied or albuterol via nebulizer but not both;
    a. True
    b. False

6. The primary pulmonary abnormality involved in congestive heart failure is;
    a. Loss of elasticity of the alveoli
    b. Bronchospasm of the terminal bronchioles
    c. Fluid collection in the alveoli
    d. Poor perfusion of the lung

7. CPAP works primarily by;
    a. Reversing bronchospasm
    b. “Splinting” the lung by keeping the alveoli expanded
    c. Forcing oxygen into the blood stream
    d. Maintaining an open airway

8. CPAP should be discontinued if;
    a. The patient becomes unresponsive
    b. The patient vomits
    c. The patient becomes extremely claustrophobic and anxious
    d. All of the above

9. All of the following are contraindications for CPAP except;
    a. Facial hair
    b. Vomiting
    c. Unable to follow commands
    d. Blunt chest trauma

10. As ventilation worsens;
    a. Oxygen saturation and carbon dioxide concentrations go up
    b. Carbon dioxide concentration and oxygen saturation go down
    c. Oxygen saturation goes down and carbon dioxide concentration goes up
    d. Oxygen saturation goes up and carbon dioxide concentration goes down

11. The most important benefit of the use of pre-hospital CPAP in patients with respiratory distress is;
    a. Lower healthcare costs
    b. Decreased need for intubation
    c. Shorter transport times
    d. Fewer ALS intercepts

12. According to protocol, vital signs for patients on CPAP should be recorded;
    a. Every 5 minutes
    b. Every 10 minutes
    c. As often as possible
    d. Only if patient worsens

13. The most reliable indication of worsening respiratory distress is;
    a. Oxygen saturation
    b. Respiratory rate
    c. Level of consciousness
    d. Heart rate

14. Which part of the CPAP apparatus controls the oxygen concentration?
    a. The flow of oxygen from the tank
    b. The PEEP valve
    c. The mask seal
    d. The flow generator

15. Before applying the CPAP to a patient it is vital to;
    a. Insert the PEEP valve first
    b. Explain to the patient what you are doing and what to expect
    c. Connect the in-line nebulizer first
    d. Turn off the oxygen flow so the patient can hear you

16. The amount of air moved in and out with each breath is called the;
    a. Total volume
    b. Residual capacity
    c. Tidal volume
    d. Functional reserve capacity

17. Higher CPAP pressures can result in all the following except;
    a. Collapse of the alveoli
    b. Gastric distention and vomiting
    c. Inability of the patient to tolerate CPAP
    d. Decrease in blood pressure

18. Providing bronchodilators via a nebulizer in-line with the CPAP circuit results in:
    a. More medication reaching deeper into the lungs
    b. Less loss of medication during exhalation
    c. Faster clinical improvement in your patient
    d. All of the above

19. After initiating CPAP it is important to contact medical control because;
    a. The hospital needs to arrange for a critical care bed
    b. The ED needs to prepare their CPAP equipment prior to your arrival
    c. The medical director must order an ALS intercept
    d. All of the above

20. The presence of wheezing always indicates bronchospasm;
    a. True
    b. False

21. The lung sound associated with congestive heart failure are called;
    a. Wheezes
    b. Rhonchi
    c. Rales/crackles
    d. Stridor

22. CPAP is <u>most</u> appropriate for;
    a. Anyone complaining of shortness of breath
    b. Only those in severe respiratory distress
    c. Only those without a DNR order
    d. Those on CPAP at home

23. All of the following are types of obstructive lung disease <u>except;</u>
    a. Pneumonia
    b. Asthma
    c. Emphysema
    d. Chronic Bronchitis

24. To use CPAP the EMT must make the diagnosis of COPD, Asthma, CHF, or pneumonia;
    a. True
    b. False

25. Patient on CPAP becomes unresponsive. Which of the following steps should be taken?
    a. Insert an oral airway and continue CPAP since it works like a ventilator
    b. Discontinue CPAP and ventilate the patient with BVM
    c. Increase the oxygen concentration if you have a variable flow generator
    d. All of the above.